REMARKS

Claims 1, 4, 11-17 remain pending. Arguments for the patentability of the claims over the prior art of record are presented. Accordingly, Applicants respectfully submit that the present application is in condition for allowance.

I. Claim Rejections - 35 USC §103(a)

A. In the FINAL Office Action dated June 3, 2009, claims 1 and 13-16 are rejected under 35 USC §103(a) as being obvious over JP 2002-069623 A.

Independent claim 1 of the present application requires: (a) a sputtering target containing Co, Cr, Pt and B; (b) a target surface prepared by melting and rolling in which intermetallic compounds, oxides, carbides, carbonitrides and other substances without ductility exist in a highly ductile matrix phase of said sputtering target at a volume ratio of 1 to 50%; (c) the substances without ductility being of a size in which an average particle diameter is at least 0.5 to 50μm; (d) a Vickers hardness of said highly ductile matrix phase being 400 or less; (e) a Vickers hardness of the substances without ductility being 400 or more; (e) a hardness difference thereof being at least 1.5 times; and (f) wherein defects of 10μm or more resulting from machine work do not exist.

Of the above limitations, the Examiner readily acknowledges that JP '623 only discloses a sputtering target containing Co, Cr, Pt and B having a target surface prepared by melting and rolling in which boride exists in network form (not particles).

It is readily acknowledged in the FINAL Office Action that JP '623 fails to disclose: (b) intermetallic compounds, oxides, carbides, carbonitrides **and** (i.e., not merely "or") other substances without ductility in **a highly ductile matrix phase** (i.e., not a ductile phase of merely "cells") of said sputtering target at **a volume ratio of 1 to 50%**; (c) the substances without

ductility being of a size in which **an average particle diameter is at least 0.5 to 50μm** (i.e., not a network); (d) a Vickers hardness of said highly ductile matrix phase being **400 or less**; (e) a Vickers hardness of the substances without ductility being **400 or more**; (e) a hardness difference thereof being at least **1.5 times**; and (f) wherein **defects of 10μm or more resulting from machine work do not exist**.

Despite these deficiencies, the Examiner in the FINAL Office Action concludes that all the above deficiencies with respect to JP '623 would simply be "obvious to one of ordinary skill in the art" based on an assumption that the claimed and prior art products are "identical or substantially identical in structure or composition and, or are produced by identical or substantially identical processes". Applicants disagree.

In this response, Applicants provide factual reasons why the products and methods of manufacture are not identical; these reasons being based on the clear disclosure of the description of the resulting structure of the product of JP '623 specifically stated by the specification of JP '623. Also, in this response, Applicants provided scientific reasons why the target of JP '623 would have defects that the present invention clearly is required not to have. For these reasons, Applicants respectfully submit that claims 1 and 13-16 are not obvious in view of JP '623.

As for metal materials, their structures and characteristics are determined by both the chemical composition and the processing conditions (including heat treatment). Consequently, the composition and characteristics of two metal materials can be determined to be identical only when both their chemical composition and processing conditions are the same.

It should be stated at the outset that while JP '623 discloses a composition, it fails to disclose in sufficient detail how its sputtering target is made. Thus, producing experimental data based on pure guesses about the details of the method of JP '623 is unrealistic, impractical and would likely be of little meaning. However, JP '623 does disclose the obtained "structure" in

detail and it is clear that the obtained structure is different than that of the present application. Thus, while the composition is similar, the structure produced from the composition is clearly different; this is a fact based on the written specification of JP '623.

Thus, as stated above, when considering the scientific reason for the cause of this difference in structure, it is considered to be a result of using different manufacturing conditions. The manufacturing processes mainly include the processes of dissolution, casting, and rolling. Here, the rolling condition is considered to be the major cause in the difference of structures.

With respect to the structure of the present invention, the sputtering target body is required to have a surface including **particles** of intermetallic compounds, oxides, carbides, and carbonitrides existing **within a highly ductile matrix phase at a volume ratio of 1 to 50%**, and the particles are required to have an **average particle diameter of at least 0.5μm**. Thus, this alloy structure is configured from: (a) an island-shaped rolled structure or a Co-rich phase derived from primary crystals that are formed during the casting process; (b) an island-shaped structure of a Co-rich phase derived from eutectic crystals that are formed during solidification; and (c) an island-shaped structure of a B-rich phase derived from eutectic crystals that are formed during solidification.

In contrast, the alloy structure of JP '623 is configured from "cells" with a mean diameter of 200μm or less that are divided by a **network formed from boride**. Thus, JP '623 discloses that the sputtering target has a "fine and uniform microstructure" and a continuous "network" of boride that defines "cells" of 200μm or less (see, for instance, Paragraph Nos. 0012-0017 of JP '623.) The boride is a substance without ductility. However, in JP '623, the boride is not provided as particles mixed and suspended within a highly ductile matrix phase; rather, the **boride forms a continuous network that defines cells of 200μm or less for non-boride material**.

When comparing the structure of the present invention with the structure of JP '623, the "cells" of JP '623 clearly correspond to the "Co-rich phase derived from primary crystals" of the present invention (i.e. identified as (a) above). In addition, it can be assumed that the "boride" of JP '623 corresponds to the B-rich phase derived from eutectic crystals of the present invention (i.e. identified as (c) above). However, this disclosed structure of JP '623 clearly lacks the "Co-rich phase derived from eutectic crystals" of the present invention (i.e. identified as (c) above). Consequently, the alloy structures of the present invention and JP '623 are clearly different.

Specifically, with JP '623, it is considered that the cast structure of the "Co-rich phase derived from eutectic crystals" was lost because the heat history during the rolling process is long. The structure will change if the heat history is unduly added as described above. Thus, the present invention is unique in that it performs heat rolling with an optimal heat history at a bare minimum. This aspect is considered to have caused the difference in structure between the present invention and JP '623.

Accordingly, although the present invention and JP '623 may have a similar or overlapping chemical composition of a Co-Cr-Pt-B alloy, JP '623 fails to disclose specific details and conditions concerning casting and plastic forming and there exists no reasonable grounds for concluding that the processing conditions of the present invention and JP '623 are identical. As explained above, judging from the disclosed information concerning the resulting structures formed by the methods, the compositions obtained in the present invention and JP '623 are of a similar Co-Cr-Pt-B system, but their formed structures are distinctively different as mentioned above.

Further, JP '623 fails to describe or disclose the use of surface finishing. Thus, the surface of JP '623 will clearly not fall within the scope of the present application which is subject to specifically required processing in order to obtain the present invention. Absent such

processing, JP '623 cannot possibly possess the same, identical or nearly identical surface characteristics. For example, compare the factual evidence provided by the results of Comparative Examples 1-4 disclosed in the present application, as filed, with Examples 1-2 disclosed in the present application, as filed (pages 7-11).

An additional surface limitation has been added into claim 13; namely, that the surface be flat and smooth without undulation. No new matter was added; for example, see: page 6, line 14; page 7, lines 1-3; page 8, Table 1, last line; and page 11, lines 9-10, of the present application, as filed. Thus, it is clear from the specification of the present application, as filed, only a specific combination of process steps can produce the claimed surface of a sputtering target having the claimed structure and composition.

Accordingly, Applicants respectfully request the Examiner's reconsideration of JP '623, its limited disclosure relative to method of manufacture, and its detailed disclosure with respect to resulting structure and composition. While the composition overlaps with that of the present invention, the structure of the present invention is clearly different than that disclosed by JP '623 and that can only mean that the method of manufacture is different. In this case, it is believed that the rolling conditions and the heating during such processing are different thereby producing structural differences that are clearly identifiable by the written specification of JP '623.

B. *In the FINAL Office Action dated June 3, 2009, claims 4, 12 and 17 are rejected under 35 USC §103(a) as being obvious over JP 2002-069623 A in view of JP 2002-208125 A further in view of U.S. Patent No. 6,153,315 issued to Yamakoshi et al. and still further in view of U.S. Patent No. 5,460,793 issued to Kano et al.*

Claims 4, 12 and 17 are directed to methods. By way of example, claim 4 is directed to a method for processing a sputtering target, comprising the steps of: preparing a target having the structure discussed above in detail with respect to claims 1 and 13-16; subjecting the target to

cutting work by cutting a thickness of 1mm to 10mm from the target surface; and then subsequently finish processing the target via polishing a thickness of 1μm to 50μm from the target surface such that defects of 10μm or more resulting from machine work do not exist. Claim 17 also requires the target surface to be flat and smooth without undulation.

As discussed above, JP '623 fails to disclose the structure of the target required by claims 1 and 13-16. In addition, JP '623 certainly fails to disclose the combination of any processing steps with respect to subjecting the target to cutting work by cutting a thickness of 1mm to 10mm from the target surface, and then, subsequently finish processing the target via polishing a thickness of 1μm to 50μm from the target surface such that defects of 10μm or more resulting from machine work do not exist in the surface of the target.

In the Office Action, a second reference, JP '125, is cited for disclosing the step of subjecting the target to cutting work; a third reference, Yamakoshi et al., is cited for the step of polishing a target surface; and a fourth patent, Kano is cited for removing 20 to 100μm of the target surface.

Turning to the above referenced secondary references, it is clear that these references fail to cure any of the deficiencies with respect to preparing the claimed sputtering target having the specific structural characteristics discussed above. In addition, while these references provide a description regarding the polishing of surfaces of sputtering targets, their object relates to "controlling the surface roughness" or "removing the machined surface layer."

In contrast, an object of the present invention is to eliminate defects in the form of cracks, indentations caused by fallouts, or in some cases fragments remaining in the indentation. With respect to this point, the secondary reference, JP '124, specifically teaches that polishing is not effective in eliminating surface defects. For example, JP '125 teaches that polishing will cause

abrasive grains to become embedded in the target material surface, and thereby cause the characteristics of the sputtering target to deteriorate. More specifically, JP '125 states that:

> "When polishing finishing performed surface finish, the abrasive grain sank in the target material surface, and it was thought that it became a cause of membrane-characteristics degradation." [See Paragraph No. 0004.]

Applicants respectfully submit that it is well established that "teaching away" is the antithesis of the art suggesting that the person of ordinary skill in the art go in the claimed direction. Essentially, "teaching away" is a per se demonstration of lack of obviousness. In re Fine, 873 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988).

Consequently, there is no motivation provided by JP '125 for utilizing polishing on the target of JP '623. JP '125 teaches that polishing causes a "degradation" of the surface and thus teaches-away from the combination of the steps of cutting **and** polishing required by claims 4 and 17 of the present application. Accordingly, Applicants respectfully submit that the JP '125 provides a contrary teaching relative to the other cited secondary references and its combination with the other secondary references would not be obvious to one of ordinary skill in the art.

In addition, the sputtering target of JP '623 is required to have a brittle phase of boride existing in a network-like shape. Since this boride phase is brittle, it is not possible to cut the boride with a cutting tool without causing significant defects in the brittle boride network. Thus, for this additional practical and scientific reason, it would not be obvious for one of ordinary skill in the art to combine the cutting teachings of JP '125 with the brittle boride network sputtering target of JP '623 since one of ordinary skill in the art would realize that it is not possible to cut the brittle boride network with a cutting tool without causing significant defects in the boride network.

Further, it is clear that polishing of the boride network is indispensible to process the boride network of JP '623 without generating any defects. However, JP '623 fails to teach

polishing in any way, thus, it would be inappropriate to determine that the target surface of JP '623 is free of defects. Further, JP '125 discloses that such a target should not be subject to polishing because it will cause degradation. If only a polishing step is utilized, undulations will occur on the surface as in the case of Comparative Example No. 4 disclosed by the present application, as filed.

Accordingly, Applicants respectfully submit that the specific combination of method steps recited in claims 4 and 17 are novel and non-obvious relative to JP '623 in view of JP '125 and further in view of Yamakoshi et al. and Kano. Further, the differences in structure of the sputtering target and surface defects of the sputtering target also provide subject matter that is patentable and non-obvious relative to the cited references.

Accordingly, Applicants respectfully request reconsideration and removal of the obviousness rejection of claims 4, 12 and 17.

C. *In the FINAL Office Action dated June 3, 2009, claim 11 is rejected under 35 USC §103(a) as being obvious over JP 2002-069623 A in view of JP 2002-208125 A further in view of U.S. Patent No. 6,153,315 issued to Yamakoshi et al. and still further in view of U.S. Patent No. 5,460,793 issued to Kano et al. and yet further in view of U.S. Patent No. 4,895,592 issued to Hatwar.*

Applicants respectfully submit that claim 11 is patentable and not obviated by JP '623 in view of JP '125, Yamakoshi et al., Kano et al., and Hatwar for the same reasons claims 1 and 13-16 are patentable over JP '623 and for the same reasons that claims 4, 12 and 17 are patentable and not obvious over JP '623 in view of JP '125, Yamakoshi et al., and the Kano et al. patent. See arguments above.

Accordingly, Applicants respectfully request reconsideration and removal of the obviousness rejection of claim 11.

III. Conclusion

In view of the above amendments and remarks, Applicants respectfully submit that the claim rejections have been overcome and that the present application is in condition for allowance. Thus, a favorable action on the merits is therefore requested.

Please charge any deficiency or credit any overpayment for entering this Amendment to our deposit account no. 08-3040.

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